

CLAIMS

What is claimed is:

1. An isolated nucleic acid fragment encoding a plant SUG1 protein comprising a member selected from the group consisting of:
  - 5 (a) an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NOs:2, 4, 6, 12, and 14;
  - (b) an isolated nucleic acid fragment that is substantially similar to an isolated nucleic acid fragment encoding all or a substantial portion of  
10 the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NOs:2, 4, 6, 12, and 14; and
  - (c) an isolated nucleic acid fragment that is complementary to (a) or (b).
2. The isolated nucleic acid fragment of Claim 1 wherein the nucleotide sequence of the fragment is set forth in a member selected from the group consisting of SEQ ID  
15 NOs:1, 3, 5, 11, and 13.
3. A chimeric gene comprising the nucleic acid fragment of Claim 1 operably linked to suitable regulatory sequences.
4. A transformed host cell comprising the chimeric gene of Claim 3.
5. A method of altering the level of expression of a plant SUG1 protein in a host  
20 cell comprising:
  - (a) transforming a host cell with the chimeric gene of Claim 3; and
  - (b) growing the transformed host cell produced in step (a) under conditions that are suitable for expression of the chimeric genewherein expression of the chimeric gene results in production of altered levels of a plant  
25 SUG1 protein in the transformed host cell.
6. A method of obtaining a nucleic acid fragment encoding all or substantially all of the amino acid sequence encoding a plant SUG1 protein comprising:
  - 30 (a) probing a cDNA or genomic library with the nucleic acid fragment of Claim 1;
  - (b) identifying a DNA clone that hybridizes with the nucleic acid fragment of Claim 1;
  - (c) isolating the DNA clone identified in step (b); and
  - (d) sequencing the cDNA or genomic fragment that comprises the clone isolated in step (c)wherein the sequenced nucleic acid fragment encodes all or substantially all of the amino  
35 acid sequence encoding a plant SUG1 protein.

7. A method of obtaining a nucleic acid fragment encoding a portion of an amino acid sequence encoding a plant SUG1 protein comprising:

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- (a) synthesizing an oligonucleotide primer corresponding to a portion of the sequence set forth in any of SEQ ID NOs:1, 3, 5, 11, and 13; and
  - (b) amplifying a cDNA insert present in a cloning vector using the oligonucleotide primer of step (a) and a primer representing sequences of the cloning vector

wherein the amplified nucleic acid fragment encodes a portion of an amino acid sequence encoding a plant SUG1 protein.

10 8. The product of the method of Claim 6.

9. The product of the method of Claim 7.

10. A method for evaluating at least one compound for its ability to inhibit the activity of a plant SUG1 protein, the method comprising the steps of:

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- (a) transforming a host cell with a chimeric gene comprising a nucleic acid fragment encoding a plant SUG1 protein, operably linked to suitable regulatory sequences;
  - (b) growing the transformed host cell under conditions that are suitable for expression of the chimeric gene wherein expression of the chimeric gene results in production of the SUG1 protein encoded by the operably linked nucleic acid fragment in the transformed host cell;
  - (c) optionally purifying the SUG1 protein expressed by the transformed host cell;
  - (d) treating the SUG1 protein with a compound to be tested; and
  - (e) comparing the activity of the SUG1 protein that has been treated with a
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- test compound to the activity of an untreated SUG1 protein,

thereby selecting compounds with potential for inhibitory activity.